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The Earliest South Carolinians: The Paleoindian Occupation Of South Carolina

James L. Michie

Albert C. Goodyear

Tommy Charles

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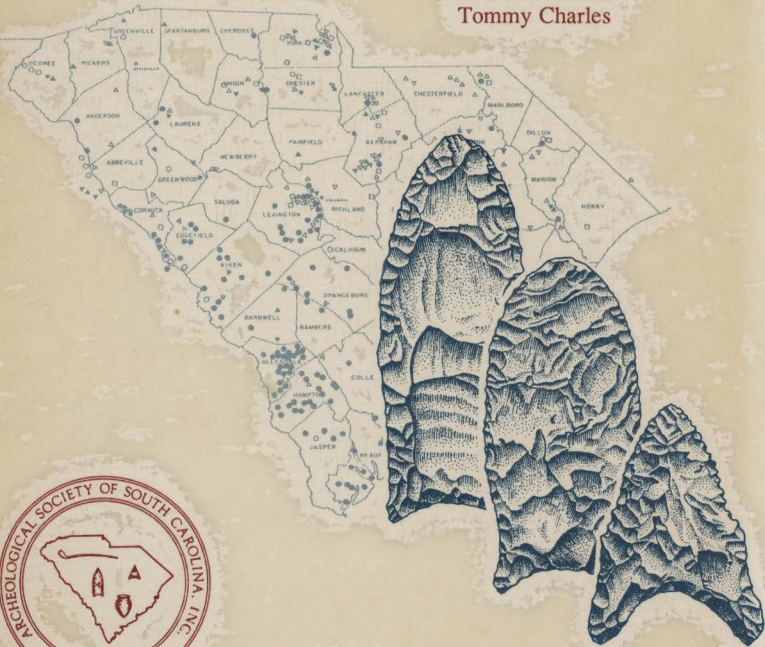
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THE EARLIEST SOUTH CAROLINIANS

The Paleoindian Occupation of South Carolina

Albert C. Goodyear, III
James L. Michie
Tommy Charles



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The Archaeological Society of South Carolina, Inc.
Occasional Papers No. 2

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Cover: Distribution of Paleoindian lanceolates in South Carolina. Drawing of points by Darby Erd. Left-Clovis point, Allendale Co.; middle-Suwannee point, Aiken Co.; right-Dalton point, Allendale Co., 38AL135.

Thank for helping with our
exhibit plans - Jimmy Clark

THE EARLIEST SOUTH CAROLINIANS

The Paleoindian Occupation of South Carolina

by
Arthur C. Gossypen III
James L. Mather
Jimmy Clark

1982

The Archaeological Society of South Carolina, Inc.
Occasional Papers No. 7

Printed by
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THE EARLIEST SOUTH CAROLINIANS The Paleoindian Occupation of South Carolina

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Albert C. Goodyear III
James L. Maine
Thomas J. Clark

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Preface

This reprinting of the previously published article "The Earliest South Carolinians" as the Society's Occasional Paper No. 2, was done in an effort to disseminate more broadly a summary of our findings concerning Paleoindian archaeology in South Carolina based on the last 25 years of research. The study of Paleoindian in the eastern United States is of such a general interest to both professional and avocational audiences that a monograph treating South Carolina will hopefully be a welcomed addition to the growing regional literature.

This publication has been made possible through the generous support of Mr. Jack G. Willhoit, owner of American Systems of the Carolinas, Inc., who graciously printed this version through that company. Permission to reprint the article originally published as Chapter 2 of *Studies in South Carolina Archaeology, Essays in Honor of Robert L. Stephenson*, Anthropological Studies 9, South Carolina Institute of Archaeology and Anthropology, University of South Carolina, was granted by Bruce Rippeteau, Director and State Archaeologist. We extend our thanks to Bruce for his support of the Archaeological Society of South Carolina through his good offices and that of the entire South Carolina Institute of Archaeology and Anthropology. We also acknowledge the help provided by Ken Sassaman, Editor of *South Carolina Antiquities* of ASSC in preparing this version. Ken was particularly helpful in designing the cover. Jonathan Leader and Diane Moses are thanked for their help in formatting this version for publication. We also thank Darby Erd who drew the points specifically for the cover.

The authors wish to thank the numerous individuals who over the years have contributed primary data to this synthesis by sharing their artifact and site findings. Without their cooperation this study would not have been possible. Photographs were done by Gordon Brown and Tommy Charles. Drawings were done by Darby Erd, Ann Salter, and Marianna DePratter. David Anderson, Mark Brooks, Glen Hanson, and Ken Sassaman all read the manuscript and offered valuable comments. Funding for the Allendale chert quarries research has been provided by the South Carolina Department of Archives and History, the South Carolina Institute of Archaeology and Anthropology, the University of South Carolina, South Carolina Underwater Archaeological Research Council, and the National Geographic Society.

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THE EARLIEST SOUTH CAROLINIANS The Paleoindian Occupation of South Carolina

Albert C. Goodyear, III, James L. Michie, and Tommy Charles

The earliest humans to live in what is now known as South Carolina likely arrived there some 12,000 years ago. This is based on the finding of fluted points similar to many others also found in the southeastern United States which share attributes with classic Clovis points found in association with extinct Pleistocene fauna in the southwestern United States. No archaeological evidence of a pre-Clovis nature has been found there, a finding that would seem to parallel the North American situation (cf. Dinauaze 1984).

This paper reviews the evidence of the first 1,500 years (11,500-10,000 B.P.) of human occupation in South Carolina based on lithic remains found there as well as comparable archaeological remains from adjacent regions of the Southeast. After discussing paleoenvironmental conditions, the history of Paleoindian archaeological research is reviewed focusing on the methods and results of the two lanceolate point surveys which have been conducted in South Carolina. Typological problems, geographic distributions, and patterns of raw material utilization are discussed for the fluted and lanceolate points recorded in the state.

THE EARLY HOLOCENE ENVIRONMENT

It is known primarily from palynological studies conducted throughout the Southeast that substantial climatic and vegetational changes occurred over this area during the late Pleistocene and early Holocene time period. To date, nearly all of these studies have taken place in states other than South Carolina. The one important exception to this situation is the study of White Pond located in the center of South Carolina (Watts 1980).

By convention the end of the Pleistocene and the beginning of the Holocene has been arbitrarily set at 10,000 B.P. or 8,000 B.C. (Whitehead 1965; Griffin 1967). This is a chronostratigraphic designation for purposes of world-wide periodization (Harland *et al.* 1982; cf. Mercer 1972). Palynological data gathered from throughout the Southeast in the past two decades, however, have substantially modified views as to the beginning of the Holocene climate and vegetation. In

the Southern Appalachians, by as early as 16,500 B.P., evidence of climatic amelioration is apparent as temperate deciduous tree species began expanding from refugial areas replacing boreal types (Delcourt and Delcourt 1985:19).

By 12,500 B.P., the transition from Pleistocene to Holocene biotic communities was quite distinct at mid-latitudes (33° - 37°), where a second major floral response occurred. This resulted in a complete change-over where temperate deciduous plant communities came to dominate the former boreal types (Delcourt and Delcourt 1985:19). These cool, mesic temperate species, such as beech, hickory, hornbeam, oak, elm, and ash were interpreted to represent what Watts (1980; Watts and Stuiver 1980) and others (Delcourt and Delcourt 1979:98) have variously called a mesic, cool, temperate, broad-leaved forest. This forest existed from about 12,500 to 8,500 B.P. and exhibited a clear southern boundary following the 33° N. latitude (Delcourt *et al.* 1983:164). In South Carolina, the 33rd latitude runs just north of Charleston, westward through Allendale. What is thought to be a remnant of this species-diverse, temperate deciduous forest exists today in the Piedmont province at Stevens Creek in McCormick County, South Carolina (Radford 1959; Delcourt and Delcourt 1979:98).

A classic palynological representation of the early Holocene mesic forest has been recorded at White Pond (Figure 1) located in the inner Coastal Plain near Elgin, South Carolina (34° 10' N). The early environmental changes outlined for the Southeast as a whole were clearly documented here by Watts (1980), complete with radiocarbon dates at critical points of change. For these reasons, the White Pond palynological sequence serves as a paleoecological benchmark for archaeologists working in South Carolina.

As recorded at White Pond, at approximately 12,800 B.P., a dramatic vegetation shift occurred where colder, drier boreal species such as *Pinus* (jack pine?) and *Picea* (spruce) were replaced by deciduous species. Watts (1980:192) refers to this remarkably dis-

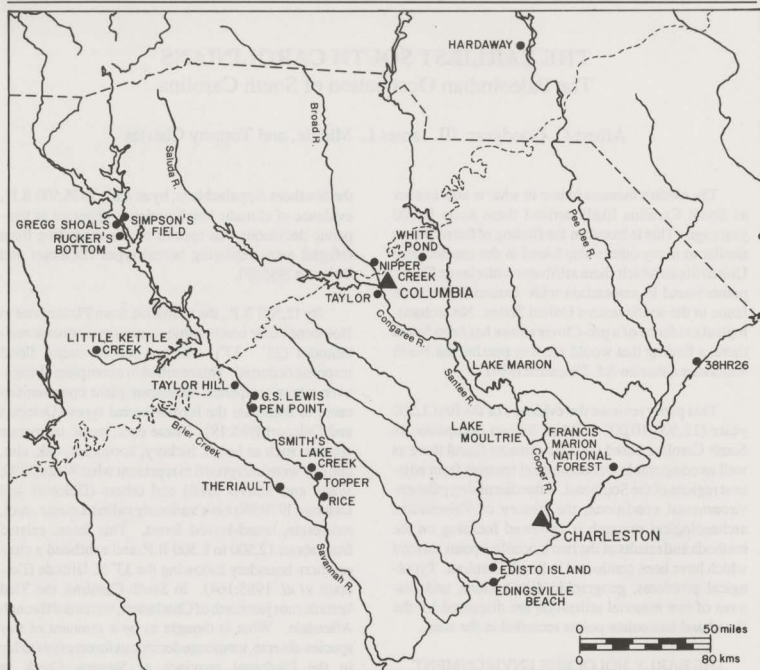


Figure 1: Locations of important paleoenvironmental and Paleoindian sites in and near South Carolina.

tinct horizon as the *Fagus-Carya* zone. It is neatly bracketed by C^{14} dates of $12,810 \pm 190$ yr B.P. (QL-1170) and $9,550 \pm 40$ yr B.P. (QL-1169). Deciduous species which dominate the pollen count are *Quercus* (oak), *Carya* (hickory), *Fagus* (beech), and *Ostrya* *Carpinus* (ironwood). "*Betula* (birch), *Ulmus* (elm), *Acer saccharum* (sugar maple), *Juglans nigra* (black walnut), *Tsuga* (hemlock), and *Corylus* (hazelnut) are exclusive to the zone or infrequent outside of it" (Watts 1980:192). Watts suggests that beech and hickory may have comprised up to 25% of the nearby forest. For this period (ca. 13,000 - 9,500 B.P.), Watts (1980:197) concludes that the climate was moister and cooler than today, and he suggests that the modern temperatures of New York State and areas to the north may provide a climatic analog for the ancient *Fagus-Carya* zone. In the White Pond region, although winters were proba-

bly harsher during this time than temperatures of today, the growing season was probably not any shorter (Paul Delcourt, personal communication, 1986).

After 9,550 B.P., the *Carya*, *Fagus*, and *Ostrya* *Carpinus* types were rapidly replaced by modern "southern" pine and oaks. *Liquidambar* (sweet gum) and *Nyssa* (blackgum?), the hardwood dominants of the Coastal Plain today, appear for the first time signalling the onset of the modern forest conditions (Watts 1980:194). From 9,500 to 7,000 B.P. oak was dominant. After about 7,000 B.P., pine replaces oak as the dominant and the modern forest was essentially established (Watts 1980:194).

The climate of the mesic deciduous forest across the mid latitudes of the Southeast is broadly recon-

structed by the Delcourts as "cool-temperate" with abundant moisture available in the growing season (Delcourt and Delcourt 1984:276). They attribute this to two different weather systems, the Pacific Airmass dominating the winter and the Maritime Tropical Airmass of the summer. The climate at this time interval also exhibited maximal seasonality compared to climatic periods before and later in the Holocene (Delcourt and Delcourt 1984:280).

South of the 33° N parallel across the Southeast during the period 12,500 to 8,500 B.P., climate and vegetation were different from the mid latitudes. Perhaps the most striking characteristic of the flora of the Southeast Coastal Plain, known as the Southeastern Evergreen Forest (Braun 1950), is its stability over the last glacial/interglacial cycle (Delcourt and Delcourt 1985:20). An example of the time depth of this stability is the site of Goshen Springs on the inner Coastal Plain of Alabama. From about 20,000 to 6,000 B.P., the area was dominated by oak, hickory, sweetgum, and southern pine (Delcourt and Delcourt 1983:269). Other pollen studies conducted on upland interfluvial sites on the Gulf Coast Plain and peninsular Florida indicate that "Even during the Wisconsin glacial maximum, no major invasions of cool-temperate or boreal species occurred..." (Delcourt and Delcourt 1983:269).

The climate reflected in the paleovegetation of the Coastal Plain was warm and temperate, as it is today. Delcourt and Delcourt (1983:269) view the interfluvial uplands as possessing a "...relatively constant flora, but with minor changes in the relative abundances of constituent species as they adjusted to subtle changes in drought stress and fire frequency." They infer from the pollen cores with time depth including those that exceed the time range of C¹⁴ dating, that the Maritime Tropical airmass has prevailed in the southeastern Coastal Plain during the last 60,000 years providing for general constancy in the climate.

During the early and middle Holocene some floristic changes from the area of White Pond southward throughout the Atlantic and Gulf Coastal Plains can be detected in fossil pollen assemblages that are attributable to changes in weather systems. The demise of the cool mesic temperate forest at about 9,500 B.P. north of 33° N led to an oak dominated forest with a minimum of pine over much of the Southeast (Watts 1975:290; Delcourt and Delcourt 1985:20). In the region of Goshen Springs in south-central Alabama, prior to 8,000 B.P., Delcourt (1985:21) reconstructs the upland vegetation as dominated by oak, hickory, and southern

pine which indicate "warm-temperate temperatures and summer drought." Sometime around 8,000 B.P. over the entire lower Southeast, there is strong evidence based on pollen data and sedimentation rates that summer precipitation was greatly increased. Beginning at about 8,000 B.P. southern *Diploxylon Pinus* increases at the expense of oak and hickory (Delcourt 1985:22-23). Lacustrine sedimentation is markedly increased as well as water depth resulting from an increased frequency of summer thunderstorms provided by the Maritime Tropical Airmass (Delcourt 1985:22-23). From the standpoint of human adaptation, increased precipitation likely resulted in greater availability and reliability of surface water habitats beginning with what archaeologists call the Middle Archaic (Goodyear *et al.* 1979:106).

At this point in palynological studies of the late Quaternary of the Southeast, it is apparent that additional data are needed for the South Atlantic region (Watts 1980:188). The entire Coastal Plain of South Carolina is devoid of published pollen studies with radiocarbon dates and the Coastal Plain of Georgia nearly so. This represents a 500 km gap along the South Atlantic Coastal Plain (Delcourt and Delcourt 1985:Figure 1). In South Carolina, Carolina Bays are no doubt pollen traps as they are known to be elsewhere in the South Atlantic region. Limited coring of bays by geologists in the state has not usually yielded preserved organics necessary for palynological studies or at least organics of early Holocene age. An interesting exception is a core taken from a Carolina Bay near McClellanville in the Francis Marion National Forest (Figure 1) by Jan Brown and Peter Stone. This core yielded peat and other organics to a depth of seven meters. Peat was continuously present from the surface down to 4m. At 4m a radiocarbon date was obtained on peat dating 11,460 ± 160 B.P. (UM-2657) (Jan Brown and Peter Stone, personal communication, 1986). Work with this core is still in progress.

The Piedmont Province of the Southern Appalachians has scarcely been studied by palynologists owing to the rarity of geomorphic features suitable for pollen entrapment and preservation. The summary of paleoecological pollen studies of the Southeast prepared by Delcourt and Delcourt (1985:Figure 1) graphically illustrates this deficit. Some pollen work was done in connection with the Richard B. Russell reservoir archaeological mitigation studies along the Piedmont portion of the Savannah River as part of a larger program of paleoecological reconstruction (Carbone *et al.* 1982; Schuldenrein and Anderson 1988).

Three locations were studied by Sheehan, Whitehead, and Jackson (1985). Nodoroc was a bog located in the uplands near Winder, Georgia. As Sheehan *et al.* (1985) point out, a bog is a highly unusual geomorphic feature for the Piedmont. Transect Ten and the archaeological site of Gregg Shoals (9EB259) (Figure 1) both produced pollen contained in alluvial sediments. Differential preservation, truncated depositional sequences, and at one site (Nodoroc) possibly contaminated radiocarbon dates, variously affected the clarity of their results. Some parallels with Watt's (1980) findings at White Pond, however, could be determined. Sheehan *et al.* (1985:34) identified an "Early Postglacial (12,000-9,000 B.P.)" period at all three sites based on diagnostic mesic hardwood species and radiocarbon dates. The archaeological site of Gregg Shoals was particularly interesting in that lenses of organic matter about 20 cm in thickness were found resting on bedrock 100 to 200 m upstream from the site. Three radiocarbon dates, 10,370, 10,170, and 10,000 B.P. (all sigmas 140 yr) run by Teledyne Isotopes, Inc., were obtained for the organics (Sheehan *et al.*, 1985:7; Table 2). The range of pollen types from these lenses was comparable to the *Fagus-Carya* zone identified for White Pond by Watts (1980) (Sheehan *et al.* 1985:31).

The foregoing has emphasized pollen studies as a means of reconstructing the early Holocene environment. Paleontological data are also available to supplement these biotic reconstructions.

S. David Webb's (1981) paleontological synthesis of the Southeast coastal plains is particularly valuable. For the late Pleistocene, Webb (1981: Figure 4.1.10) posits three basic faunal regions distributed by latitude. From north to south these are Boreal, Temperate, and Subtropical (Figure 2). Interestingly, the present state of South Carolina is situated in a location geographically transitional to all three zones.

The Boreal zone (Figure 2) extends from about the center of South Carolina at Columbia northward through the Mid Atlantic states. Relevant species include woolly mammoth (*Mammuthus primigenius*), caribou (*Rangifer tarandus*), horse (*Equus*), and bison (*Bison*). These animals are grazers and indicate primarily a tundra habitat. Webb (1981:1-76,77) states that woolly mammoths "occur as far south as Charleston, South Carolina. There, however, they are less abundant than Columbian mammoths, and while they surely imply extensive grazing conditions, they may have been seasonal inhabitants of cool temperate grasslands rather

than boreal tundra."

The Temperate faunal zone is located by Webb (Figure 2) from about the area of central South Carolina (34° N) southward to the present day city of Charleston. The approximate lower half of South Carolina was situated in this region. Biotically, this region was highly diverse consisting of mixed temperate forests and grasslands. In addition, Webb (1981:1-78) emphasizes that the Temperate zone was "markedly compressed in a north-south direction along the Coastal Plain." Animal populations here were comprised of both grazers and browsers. Because of its narrowness, being bordered to the north by the Boreal zone and the Subtropical region immediately to the south (Figure 2), the Temperate faunal region was a prominent ecotone.

Among the more common grazers were mammoth (*Mammuthus columbi*), *M. primigenius* (woolly), which is thought to have been a seasonal inhabitant, *Bison*, and *Equus*. Other grazers which ranged down into the Temperate zone were camelids (*Camelops* and *Hemiauchenia*) and the great amphibious rodents (*Capybaras*) (Webb 1981:1-79). Among the browsers, the chief representative is the American mastodon, *Mammuth americanum*, known to exist in both spruce as well as mesophytic forests (Webb 1981:1-78). Voorhies (1974) has described a late Pleistocene faunal assemblage from Little Kettle Creek (Figure 1) in the east-central Georgia Piedmont. Economically important species include American mastodon (*Mammuth americanum*), mammoth (*Mammuth sp.*), deer (*Odocoileus cf. virginianus*), and bison (*Bison sp.*) (Voorhies 1974:85). Based on these species and others, Webb (1981:1-80) notes that both grazing and woodland browsing habitats were present. Using the ratio of mammoth-to-mastodon finds as an index to open versus wooded habitats, Webb (1981:1-79) notes that the Coastal Plain had more grasslands and the Piedmont more woodlands.

The Subtropical faunal region ranged along the Atlantic Coastal Plain from about Charleston south through most of Florida and westward along the Coastal Plain of the Gulf of Mexico. This zone formerly included a much larger area of subaerially exposed shelf due to lower eustatic sea levels (Webb 1981:1-80). The faunal species represented in this region indicate a warm, moist, equable climate. The giant tortoise (*Geochelone crassiscutata*), which was unable to tolerate freezing temperatures, indicates that winter temperatures were very mild (Webb 1981:1-81).

A famous late Pleistocene fossil site, that of Edisto

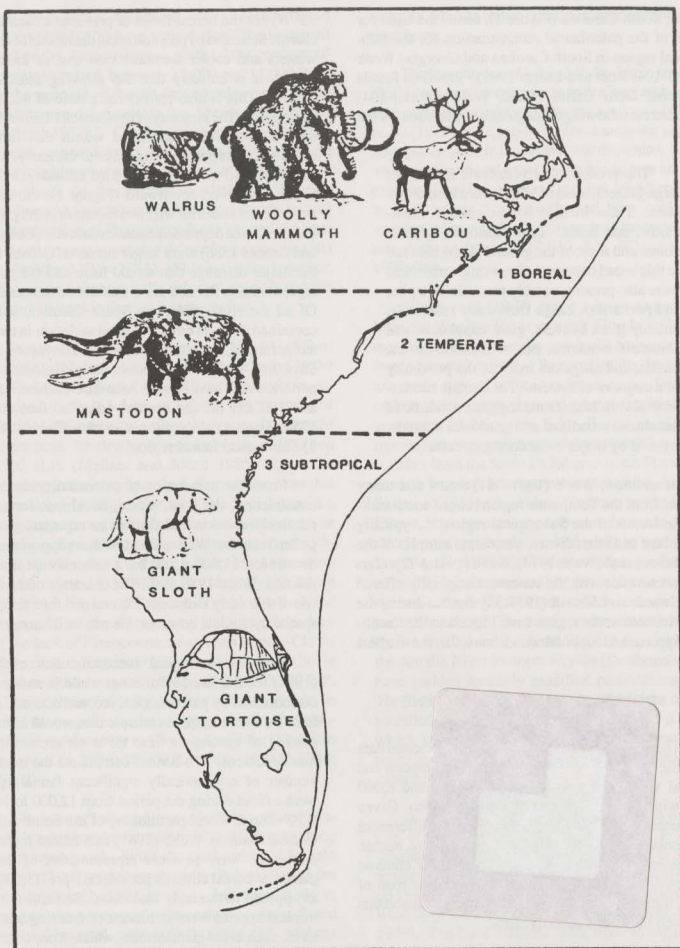


Figure 2: Late Pleistocene faunal regions of the southeastern United States coastal plains. From Webb (1981) as adapted by Carbone (1983).

Island, South Carolina (Figure 1), forms the basis for much of the paleofaunal reconstruction for the Subtropical region in South Carolina and Georgia (Webb 1981:I-104; Roth and Laerm 1980). Based on fossils recovered from Edisto Island, Webb (1981:I-104) provides the following ecological interpretation for the biota:

The predominant vertebrate fossils are large grazers, most of which were herd ungulates. These include horses, camels, mammoths, and bison. Giant tortoises, glyptodonts, and most of the ground sloths also fall in this broad category. Browsing vertebrates were also present, notably mastodons, tapirs, and peccaries. Large freshwater mammals, notably giant beavers, giant capybaras, and abundant muskrats, not to mention fishes, turtles, and alligators indicate the proximity of a major river system. The aquatic and terrestrial vertebrate fauna suggests a mosaic of deciduous woodland and grassland savanna, crossed by major meandering streams.

In addition, Webb (1981:I-81) states that many species from the Temperate region ranged south making the fossils of the Subtropical region "... typically the richest and most diverse vertebrate samples of the late Pleistocene" (Webb 1974). Webb (1981:I-77) offers his concurrence with the statement originally offered by Edwards and Merrill (1977:35) that "... during the late Pleistocene the region from Florida to the Carolinas approached optimal conditions for the earliest Americans."

PROBLEMS IN EARLY HOLOCENE HUMAN ECOLOGY

The preceding review of paleoenvironmental data is sufficient to indicate that considerable temporal and spatial variation existed between 12,000 and 8,000 B.P. within what is now called South Carolina. Given this heterogeneity, it is important that these differences be considered in any attempts at modeling human settlement. Because of the great amount of climatic and environmental change recorded for this span of time, the natural world faced by the earliest inhabitants can well be described as dynamic.

Beginning with the penetration of Clovis or Clovis-related populations into South Carolina around 12,000 to 11,000 B.P., it is clear from the pollen sequence at White Pond that these people were living in the cool, mesic, deciduous forest of the upper Southeast (above

33° N) not the boreal forest of previous millenia. The climate indicated by palynological data is that of harsher winters and cooler summers than that of today, although it is unlikely that the growing season was shorter. This is also considered a time of maximum seasonality. The majority of the Coastal Plain and all of the Piedmont were contained within this forest, a condition that apparently lasted until the Early Archaic (ca. 9,500 B.P.). Below the 33rd latitude, i.e., from about Charleston southward (Figure 1), the climate was warmer and drier with less moisture in the growing season. Given depressed eustatic sea levels (Colquhoun and Brooks 1986) and a larger subaerial Coastal Plain, the major drainage that would have had the greatest representation in each zone was the Savannah River. Of all the river valleys in South Carolina, it likely contained the most environmental variation in terms of temperatures, moisture, and biota. The mouth of the Savannah in late Pleistocene-early Holocene time periods would have met the Atlantic Ocean between 50 and 100 km off the present coastline (see Rupprecht 1980:Figure 4) placing it well within Webb's (Figure 2) Subtropical faunal region.

From the standpoint of paleoenvironmental reconstruction, the cool, mesic, deciduous forest was relatively uniform and distinct as represented in the pollen record at Whites Pond, with its appearance and demise (ca. 13,000-9,500 B.P.) rather abrupt stratigraphically (Watts 1980:190). The character of the faunal life of this early Holocene interval and their temporal-spatial dynamics, however, are not well known.

The paleontological reconstructions of Webb (1981) for the late Pleistocene, while in many ways corroborated by palynological reconstructions, as yet lack the chronological controls that would allow the placing of species in time *vis a vis* archaeological manifestations. To further complicate the matter, a number of economically significant faunal species went extinct during the period from 12,000 to 10,000 B.P. The tri-zonal partitioning of the South Atlantic Coastal Plain by Webb (1981) into faunal regions as discussed, may be more representative of the full glacial or boreal climatic period, i.e., pre-13,000 B.P. as opposed to the early Holocene. Some of the Subtropical species were intolerant of freezing temperatures, such as the giant tortoise, which at one time lived as far north as Charleston. South of the ice sheets, climate is thought to have been more equable during maximum glaciation, i.e., warm winters and cool summers, because cold arctic air would have been blocked by the fused Cordilleran and Laurentide ice

sheets (Bryson and Wendland 1967). Delcourt and Delcourt (1984:278) have argued that "The sustained arrival of the Arctic Airmass south of the continental ice sheets occurred between 12,000 and 11,000 B.P., after the opening of the ice-free corridor between the Cordilleran and Laurentide Ice Sheets (Bryson and Wendland 1967)." Clovis-age peoples should have been arriving in South Carolina about that time and were probably witnesses to the impact of cold winter temperatures on the animal populations. Whether these freezing temperatures were significantly related to the extinction of Pleistocene fauna beyond the frost intolerant types is a matter of debate for paleontologists (cf. Martin and Klein 1984). What is certain, however, is that several economically relevant animals species died out about this time or just thereafter.

In a recent study by Meltzer and Mead (1985) of available published radiocarbon dates relevant to the late Pleistocene faunal extinctions, the authors re-evaluated some 363 dates in light of strict criteria of reliability. Of interest to archaeology is the fact that the highest peak for deaths occurs between 11,000 and 11,500 B.P. (Meltzer and Mead 1985: Figure 2). According to their rating system, there are no dates that are considered reliable after 10,000 B.P. and there is a strong suggestion in the data that for such genera as *Camelops*, *Equus*, *Mammut*, *Mammuthus*, *Nothrotheriops*, and *Panthera leo atrox*, that their extinctions were complete by 10,800 B.P. (Meltzer and Mead 1985:166). Haynes (1984) has argued based on the stratigraphy of the Pleistocene-Holocene boundary and the lack of Pleistocene megafauna in post-Clovis culture sites, that extinction occurred during the Clovis period and thus was complete at least by 10,500 B.P. If Clovis culture folk were the last and only groups to exploit the megafauna, the temporal window for association is even smaller as Clovis sites in the West date from about 11,200 to 10,900 B.P. (Haynes *et al.* 1984: Table 2).

The issue of Paleoindian exploitation of late Pleistocene megafauna in the eastern United States has long been controversial. Since the publication of Ronald Mason's (1962) major synthesis on Paleoindian in the East, surprisingly little headway has been made in resolving the economic relationship between fluted point makers and now-extinct fauna (cf. Meltzer 1988:2). Very few indisputable associations have been found. In terms of mastodon, the Kimmiswick site in Missouri (Graham *et al.* 1981) is perhaps the sole clear association of fluted points and proboscidea. From there one must go all the way to the springs and

rivers of Florida to list additional associations of extinct fauna.

The famous site of Little Salt Spring in southwest Florida is a fresh water cenote with a long archaeological history of occupation. The excavations of Clausen *et al.* (1979) have produced some amazing preservations particularly in faunal and wood remains. Situated on a now inundated ledge in the spring was an extinct tortoise (*Geochelone crassiscutata*) found resting on its back where it apparently had been cooked. A wooden stake which was driven into the tortoise was radiocarbon dated at 12,030 B.P. (Clausen *et al.* 1979:609).

Webb *et al.* (1984) report a *Bison antiquus* skull from the Wacissa River in north Florida with a fragment of a chert projectile point still embedded in the fronto-parietal region. Because of its fragmentary nature the type of point is indeterminate. Two radiocarbon dates were obtained from the bison bone averaging 10,500 years B.P. Bullen *et al.* (1970) reported an obviously worked (butchered?) mammoth vertebra from the Sante Fe River in north Florida. The Florida beveled bone points reported by Jenks and Simpson (1941) resembling the bone points found at Clovis, New Mexico, are known to be made of ivory, which were apparently worked while in a green state. Webb *et al.* (1984:390) also mention the finding of other Pleistocene mammal bones such as a mammoth rib and horse from the rivers which bear evidence of human butchery. The recent underwater excavations by Jim Dunbar and S. David Webb in the sinkholes of the Aucilla River in north Florida (Dunbar *et al.* n.d.) have yielded humanly modified proboscidean bone. They are conducting underwater excavations of in situ stratified remains with datable organics in a context which should allow more precise statements to be made regarding Early Man and late Pleistocene faunal subsistence relationships.

In South Carolina evidence for human exploitation of extinct fauna has been meager. In 1975 a dragline working on a development known as Surfside Springs (38HR26) (Figure 1) in Horry County pulled up several animal bones and charcoal fragments with what may have been two crude stone tools (Wright 1976). The bone material came from an organic rich sand overlying a yellowish sand. All the bone and charcoal came from the upper organic layer. Don Colquhoun, a geology professor with the Department of Geology, University of South Carolina, interpreted the organic zone as a Holocene lake overlying a yellow

sand related to the Sangoman stadial (Wright 1976:1). Some of the bone was identified as *Mammot americanum*, *Bison*, *Cervus*, and *Ursus* and some unspecified bone was described as bison. The two tools were described as made from "cemented marl" and were found in the spoil piles not in situ. These lithics were re-examined at the Institute in 1988 by Goodyear and Michie where the archaeological and faunal materials from this site are stored. The item described as a "bifacial tool" (Wright 1976:2) is made from a metavolcanic material of poor conchoidal fracture. It does appear crudely bifacially retouched and/or battered. The second item described as a "blade" by Wright (1976:2) is questionable as an artifact based on the absence of definite flake landmarks or any technological modification. It is made from the same metavolcanic material as the first lithic which has a weak conchoidal fracture. A third lithic was found in the collections from 38HR26 that was not mentioned in the report by Wright. It is a large (3,214.6 gm) bifacially worked core made of a weathered diorite. It exhibits a clear series of bifacial flake removals from opposite margins. Whether or not Surfside Springs was an association of extinct Pleistocene fauna and man is moot. It does serve as an example of the potential for finding in situ paleontological remains which might contain a cultural association.

A more probable example of human utilization of Pleistocene fauna is a mineralized bone from Edingsville Beach on Edisto Island. This fossil was collected by Robert Mackintosh of the South Carolina Department of Archives and History and has been identified by S. David Webb of the Florida State Museum of Natural History as a proximal fragment of a proboscidean rib. The leading edge of the rib exhibits a nearly continuous series of grooves or incisions over about a eight cm area (Figure 3). There appears to be some erosion of the marks on one end of the series but the remaining incisions(?) are quite sharp (Figure 4).

The senior author took this specimen to the First World Summit Conference on the Peopling of the Americas (Tomenchuk and Bonnichen 1989) where a number of scholars familiar with humanly modified megafaunal material were able to examine it. The consensus was that there were so many marks present that simple butchering marks seemed improbable. Because the marks are so extensive, it was thought by many to be either the result of purposeful cutting or from natural processes. Further work using the Scanning Electron Microscope to the view the cross sections of the marks is planned. The specimen now

resides at the South Carolina State Museum (SCSM Cat. No. SC 84.27.1). Edisto Beach is a well known fossil collecting locality with a rich late Pleistocene faunal inventory (Roth and Laerm 1980; Webb 1981) which should provide a high potential for finding humanly modified bones. Most of the fossil finds reported in South Carolina have come from the coast and coastal rivers. Hay (1923:119) mentions finds of mastodon in Lee County and mastodon and horse near Darlington, South Carolina.

The findings of Meltzer and Mead (1985) indicating that Pleistocene faunal extinctions were completed by 10,000 B.P. and perhaps as early as 10,800 B.P. is interesting in light of the available data gathered from throughout the Southeast for the Early Archaic period. Early Archaic side and corner-notched point lithic assemblages to date have not been accompanied by faunal remains of extinct species (Goodyear 1982; Smith 1986: Table 1.2; Meltzer and Smith 1986). Although subsistence data from Dalton sites are very limited, the available faunal remains indicate that only modern Holocene animals were exploited (Goodyear 1982:391). If the revised chronological position of the Dalton horizon from 10,500 to 9,900 B.P. is correct (Goodyear 1982), there would appear to be a maximum period of a thousand years during which people and the now-extinct fauna would have been contemporary (ca. 11,500-10,500 B.P.).

ARCHAEOLOGICAL INVESTIGATIONS IN SOUTH CAROLINA AND RELATED ENVIRONS

As Stephenson (1975) has discussed in his history of archaeological research in South Carolina, there was no strong professional presence in the state until the late 1960's. This is reflected in the weakly developed state of knowledge for nearly all periods of prehistory but perhaps none more so than that of the elusive Paleoindian (Michie 1977:38). Like most southern states, an understanding of pre-10,000 B.P. peoples based on excavated in situ archaeological remains has remained difficult to acquire.

In 1966, Dr. William E. Edwards, State Archeologist and Director of the South Carolina Department of Archeology, conducted extensive excavations (142 m²) at the Theriault site (9BK2) (Figure 1), located along Briar Creek near Girard, Georgia (Stephenson 1975:52). This site and others like it along Briar Creek are famous for their abundance of chert artifacts related to local outcrops of a high quality Coastal Plain chert (Waring 1961:551-552). A single fluted point was excavated between 30 and 34 inches below surface

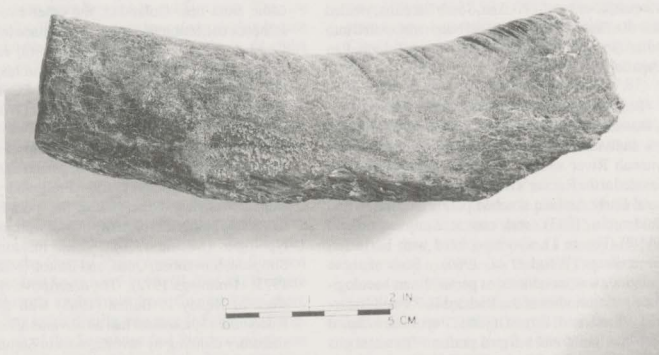


Figure 3: Photograph of proboscidean rib from Edingsville Beach, Edisto Island, South Carolina, showing location of probable cut marks. SCSM Catalog Number SC 84.27.1.

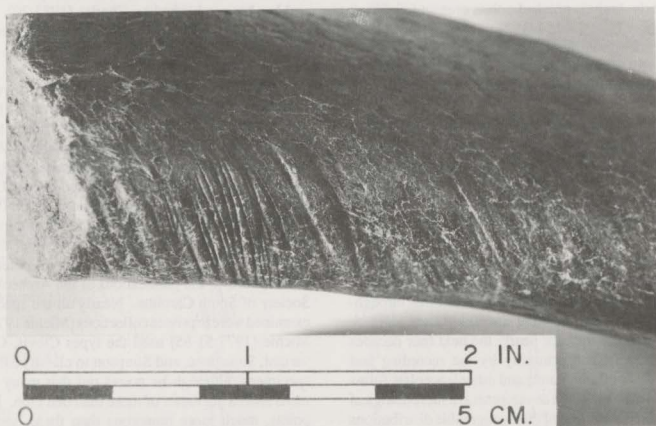


Figure 4: Close-up view of probable cut marks on proboscidean rib from Edingsville Beach, Edisto Island, South Carolina. SCSM Catalog Number SC 84.27.1.

along with Dalton and other Early Archaic points (Brockington 1971). Excavations by the Institute with the help of local archaeological societies at the 1716 British site of Fort Moore (38AK4&5) located on the Savannah River south of Aiken, South Carolina, yielded a base of a fluted point which had been redeposited into a cellar (Joseph 1971), probably from a Paleoindian occupation close by.

Beginning in the late 1970s, as a result of federally mandated cultural resource management projects, a few individual fluted points were excavated in the Savannah River valley. A single fluted point was excavated at the Rucker's Bottom site (9EB91) amongst several Early Archaic notched points (Anderson and Schuldenrein 1983), and one at Simpson's Field (38AN8) (Figure 1), also associated with Early Archaic artifacts (Wood *et al.* 1986). Both of these excavations were conducted as part of the archaeological mitigation studies of the Richard B. Russell Reservoir. Elliott and Doyon (1981) reported a fluted Dalton-like point and a fluted preform from test pits excavated at the site of Taylor Hill (9RI89), a floodplain site located near Augusta, Georgia (Figure 1). This project was a result of a proposed railroad relocation. Like other excavations yielding fluted points, these two pieces were found at the bottom of the site but with later Early Archaic notched points present (cf. Elliott and Doyon 1981:Table 14). Nonetheless, the density of curated, specialized unifacial tools recovered from Taylor Hill is quite impressive, as noted by Anderson and others (Anderson *et al.* 1986)

The discovery and excavation of Paleoindian sites with stratigraphic integrity, clarity, and interpretable assemblages, the foundation of all Paleoindian studies, is yet to be realized in South Carolina. To date, the most productive research strategy has been the state-wide lanceolate point survey (Michie 1977; Charles 1986).

The discovery of a fluted point with the remains of an extinct bison at Folsom, New Mexico, in 1927 launched a search for fluted points and kill sites throughout North America. Lacking similar kill sites, research activities in the East for nearly the next four decades were characterized primarily by the recording and description of fluted points and other lanceolate forms believed to be early, the development of morphological types, and the plotting of their geographic distributions (Mason 1962; Williams and Stoltman 1965). Because of limited reporting, South Carolina played only a minor role in these geographic summaries.

In 1939, Wauchope published a brief comment in *American Antiquity* on the existence of four fluted points from South Carolina, all found in private collections (Wauchope 1939). Two of the points were said to come from near Columbia, the other two from the Babcock collection said to have been made from around Chester. Some years later, Waring (1961) reported on four fluted points found in Beaufort and Jasper Counties. These points, probably all made of Coastal Plain (Allendale?) chert, were clearly fluted (Waring 1961: Figure 1). In the 1960s sufficient awareness was reached among avocational archaeologists within the state that fluted points were recognized and reported (Waddell 1965; Michie 1965). Preliminary attempts were also made to begin placing the sporadic finds of lanceolate points into current Southeast projectile point typologies (Michie 1970). These included Clovis, Simpson, Suwannee, Quad, and Dalton (Michie 1970, 1973; Hemmings 1972). The descriptive-typological work of Ripley P. Bullen (1968) with the Florida Paleoindian lanceolates had an obvious affect on classificatory thinking by investigators in South Carolina (e.g., Michie 1970). Beginning in 1969, recording of lanceolate points became standardized in the state through a form developed by E. Thomas Hemmings of the Institute. This form has been used by both Michie (1977) and Charles in their Paleoindian point surveys and has been published by Charles (1981:20). It has also been adapted to the Georgia Paleoindian recordation project (Anderson *et al.* 1986:6-11).

The first systematic and extensive survey of Paleoindian points was done by James L. Michie (1977). This work was summarized and presented as a Senior Thesis in the Department of Anthropology at the University of South Carolina. He presented metric and other data on 95 points obtained over a 15 year period, most of which were recorded from 1968 to 1976. Michie obtained access to the 95 specimens by developing a network of artifact collectors through personal contact and by advertising his interest in fluted points in the publications of the Archeological Society of South Carolina. Nearly all the specimens examined were in private collections (Michie 1977:42). Michie (1977:51-65) used the types Clovis, Clovis-variant, Suwannee, and Simpson to classify all of the specimens, although he points out that many specimens shared attributes of more than one type. Dalton points, much more numerous than these, were not recorded in the study.

Using this typology, Michie (1977:Tables 1-5) found the following patterns (Table 1). Of the 95 lanceolates,

70 were considered Clovis and five were Clovis-variants. Thus, 75 or 79% of the points were considered Clovis related. Sixteen were classified as Suwannee and four as Simpson. Taken together, 20 or 21% of the 95 specimens were Suwannee and Simpson. The raw material distributions by type revealed a predominance of Coastal Plain chert (Table 1). For Clovis, 54 of the 75 points or 72% were made of chert. Fifteen Clovis or 20% were made of "slate" (Table 1). Michie (1977:65) noted that "slate" and quartz seemed to be chosen for the Clovis-variants and that they were relatively small. Of the 20 Suwannee and Simpson points, 17 or 85% were made of chert (Table 1).

In terms of geographic patterns, Michie (1977:87) observed that most of the lanceolate points were from the Fall Line and Coastal Plain, with the majority found on the Coastal Plain. Suwannee and Simpson points are best known in Florida (Bullen 1975) where they are made exclusively from Coastal Plain chert. [According to his distribution map (Michie 1977:Figure 12), all of the Suwannee and Simpson points are from the southern part of the state.] His geographic distributions indicated that the larger river valleys of the state contained the majority of the specimens (Michie

1977:Figure 12), although smaller streams near the Fall Line such as Black Creek in Lexington County, and Stevens and Turkey Creeks in McCormick and Edgefield Counties, also seemed to have concentrations (Michie 1977:90). Within drainage systems, a pattern was noted that "In the majority of cases the Clovis has been found near the intersection of creeks and river valleys, especially on the highest portion of land near those intersections" (Michie 1977:87). Nearly every find was a single occurrence. Often a site was of a low artifact density or was strongly multicomponent yielding later Early Archaic points and tools (Michie 1977:42-43).

Realizing the scientific potential inherent in private artifact collections which could be found throughout the state, Michie proposed a survey and planning grant study to the South Carolina Department of Archives and History to fund a state-wide collections inventory. Five phases or seasons of survey work were undertaken by Tommy Charles for the Institute beginning in 1979, concluding in 1986 (Charles 1979, 1981, 1983, 1984, 1986). One of the objectives of this collections survey was to record lanceolate points thought to be Paleoindian. As of 1986 when the survey

Table 1
Paleoindian Lanceolate Points by Type and Raw Material from the Michie Survey (1977:Tables 1-5)

	Chert	Slate	Quartz	Quartz Crystal
Clovis n= 70	52 (74%)	13 (19%)	2 (3%)	3 (4%)
Clovis Variant n=5	2	2	1	0
Suwannee (16)	13 (81%)	2 (13%)	1 (6%)	0 0
Simpson (4)	4 (100%)	0 0	0 0	0 0
n=20	17 (85%)	2 (10%)	1 (5%)	0 0
N=95	71 (75%)	17 (18%)	4 (4%)	3 (3%)

was formally concluded, a total of 805 new prehistoric sites were added to the Institute site files and 323 private collections were recorded and analyzed. In terms of lanceolate points, a total of 204 new examples were recorded (Charles 1986:17). The survey of Charles sought to obtain as wide a coverage as possible in order to more accurately include variability among lanceolate points. An effort was made to visit every county in the state.

In studies such as these, the factors that may be influencing the patterning in point types, raw materials, and resultant geographic distributions are numerous and probably not completely known. The biases associated with private collectors, their collecting habits, the variability in landscape exposure, depth of soil erosion as well as the historical trends in such conditions all provide for biases in our data that are difficult if not impossible at this point in time to accurately assess. With these thoughts in mind, it is worthwhile to see how comparable the Michie and Charles survey results are with one another (Tables 1 and 2).

Typologically, both investigators used the same

Clovis, Suwannee, Simpson distinctions. Michie, during the late 1960s, began using the generic category "slate" to denote what has since come to be known as "metavolcanic." Charles, building on the petrologic studies of Novick (1978), House and Wogaman (1978), and Anderson (1979; Anderson *et al.* 1982), incorporated more precise distinctions such as rhyolite, welded tuff, differentially crystallized tuff, and felsic tuff. He was also able to incorporate the black, gray, and blue cherts suspected to be from the Ridge and Valley Province in his recordings, as well as distinguish as yet unsourced cherts that are unlike those normally found in the Flint River formation of Allendale County, South Carolina, and Brier Creek in Burke County, Georgia (Cooke 1936; cf. Goodyear and Charles 1984). The term "Coastal Plain chert" used by both Michie and Charles likely refers to these high-quality fossiliferous Oligocene period cherts. Cherts that match the siliceous qualities and colors of the Allendale County cherts have been found in limited outcrops in Greenwood and Edgefield Counties, South Carolina. However, it is clear that these Piedmont cherts constitute a smaller source of cryptocrystalline raw material compared to the abundant, high-quality chert sources of the

Table 2
Paleoindian Lanceolate Types by Raw Material from the Tommy Charles Survey

	Coastal Plain Chert	Unident. Chert	Ridge & Valley Ch.	Rhyolite	Welded Tuff	Differ. Crys. Tf.	Meta- volcanic	Qtz. Qtz.	Qtz. Crys.
Clovis	52	10	6	13	13	6	4	13	9
n=126	(41%)	(8%)	(5%)	(10%)	(10%)	(5%)	(3%)	(10%)	(7%)
Clovis-variant	0	0	5	2	3	1	0	1	2
n=14	0	0	(36%)	(14%)	(21%)	(7%)	0	(7%)	(14%)
Suwannee	39	1	1	6	0	0	1	8	1
n=57*	(68%)	(2%)	(2%)	(11%)	0	0	(2%)	(14%)	(2%)
Simpson	5	0	0	1	1	1	0	0	1
n=9	(60%)	0	0	(10%)	(10%)	(10%)	0	0	(10%)

N=206

* (one made of orthoquartzite - 2%)

Flint River formation.

Table 2 was constructed using the data recorded by Charles from 1979 through March 16, 1988. A total of 206 specimens were complete enough or clear enough in their form to permit classification by type. Of the 206 points, 126 were considered Clovis and 14 Clovis-Variant for a total of 140 Clovis points. Thus, 140 or 68% of his sample can be classed as Clovis. Michie's data revealed 79% Clovis. Of the 206 cases, 57 were classed as Suwannee and nine as Simpson (Table 2) or 66 which constitutes 32%. Michie's data revealed 21% were Suwannee and Simpson. In terms of raw material breakdown, 52 or 37% of the Clovis and Clovis-Variant were made from Coastal Plain chert versus 72% for Michie's data.

There are some significant differences between the data sets in terms of proportions of types and raw materials represented. Clearly, Charles saw more Suwannee and Simpson points than Michie. For raw material, Charles saw less Coastal Plain chert artifacts compared to the Piedmont metavolcanic types of raw material.

Regarding geographic distributions, some sense of coverage and patterning can be obtained by viewing Charles' map (Charles 1986: Figure 2) which is reproduced here as Figure 5. A Piedmont-Fall Line-Coastal Plain division can be made by calling the counties of Aiken, Lexington, Richland, Kershaw, Chesterfield, and Marlboro as Fall Line Counties. Remaining counties above and below are Piedmont and Coastal Plain respectively. By this classification there are 18 Piedmont counties producing a total of 86 lanceolate points. There are six Fall Line counties yielding 70 points and a total of 158 Paleoindian points came from the 22 Coastal Plain counties (Figure 5). (There are 314 points plotted in Figure 5 for South Carolina as Charles combined Michie's distributional data with his own).

Some significant patterns can be seen in Figure 5. First, by combining the Michie and Charles survey data it seems that little difference in density exists between the Piedmont and Coastal Plain. The Coastal Plain area represents about twice the land mass as the Piedmont and it has about twice the number of points (158 versus 86). However, it is possible that the deeper and less eroded soils of the Coastal Plain are not as exposed as the Piedmont soils which have almost uniformly been severely eroded (Trimble 1974). Accordingly, the Coastal Plain may be underrepresented. Compared to the Piedmont and the Coastal

Plain, the Fall Line counties represent a much smaller area yet they have produced 70 lanceolate points. The Fall Line density is specifically accounted for by the concentrations along tributary creeks which drain into the major rivers. For example, the cluster outside of Columbia is situated along the Congaree, Thoms and Black Creeks. Also, the Taylor site (38LX1) (Figure 1) (Michie 1971, 1977) situated on an old alluvial terrace near the Congaree River, has produced an estimated 12 to 15 fluted and basally thinned lanceolate points from private collecting, more than any other site known in South Carolina (Michie n.d.).

Points made of Coastal Plain chert can be seen to distribute over the entire state, but with most specimens concentrating in the south and southwestern portions (Figure 5). Of all the raw material sources, it is Coastal Plain chert that is best known as quarries have been found. The Allendale County chert quarries have been mapped and test excavated (Goodyear and Charles 1984), as well as examined petrologically by a geologist (Upchurch 1984). The terrestrial chert outcrops and quarries plus the sources available within the Savannah River itself, represent the greatest source of high quality cryptocrystalline lithic raw material known within the state. For Charles's data, 96 or 47% of the 206 points were made from Coastal Plain chert, many of which were probably made in Allendale County. While a few other cherts sources are known from the Coastal Plain in the upper Congaree (Michie 1977), lower Wateree (Anderson *et al.* 1982), and middle Santee river drainages (Anderson *et al.* 1979; Anderson *et al.* 1982), they tend to be inferior for technological purposes due to a high density of fossils and probably do not have the degree of exposure as manifested in the Allendale County quarries, such as the extensive Rice quarry (38AL14) (Figure 1). The high concentration of chert artifacts in Allendale and Hampton counties probably reflects more of a prehistoric reality than simply collector biases. While collecting in Allendale County is popular, it is also the source area for the high-quality Allendale chert. The cluster of points in Beaufort and Jasper counties probably reflects the proximity to the Allendale quarries. There are also river transported cobble cherts of Allendale quality found near Beaufort which may be local sources (Goodyear and Charles 1984:114-115; Michie 1980:76). The high-quality technological characteristics ascribed to the Allendale Coastal Plain chert would appear to be born out by the fact that Paleoindian lanceolates made from this material show up at the foot of the mountains and nearly to the North Carolina border (Figure 5), a distance in some cases of 150 miles.

The Allendale chert sources are also important for modeling Paleoindian and Archaic settlement systems because there is reasonable geographic closure on the origin of the lithic artifacts made from this distinctive material (Goodyear and Charles 1984; Sassaman *et al.* 1988; Anderson and Hanson 1988:Figure 8). From a southeastern U.S. Coastal Plain perspective, the Allendale outcrops appear to be the northern most expression of Tertiary age cherts which run fairly continuously from Tampa Bay, Florida to the western edge of Allendale County, South Carolina (Goodyear *et al.* 1985).

Lanceolates made of metavolcanic Piedmont raw materials appear to have nearly as extensive a distribution across the state as those of Coastal Plain chert (Figure 5). Metavolcanic lanceolates participate in the Fall Line river valley clusters, such as those near Columbia and Camden, and two were found near the chert quarry sources of Allendale County, one each in Hampton and Colleton Counties (Figure 5). Piedmont metavolcanic tools of Early Archaic and possibly Paleoindian age are known even at Allendale chert quarries where they appear as probable discards (see Goodyear and Charles 1984:104-105). Metavolcanic lanceolates are well represented in the Pee Dee and Santee Rivers, a logical occurrence as both drain areas of the metavolcanic-rich Piedmont of northern South Carolina and western North Carolina. The concentrations in Kershaw, Lancaster, Chesterfield, and York Counties, South Carolina, are suspected to be related to high-quality rhyolite and welded tuff outcrops which occur in the Uwharrie Mountain region just over the border in North Carolina (Novick 1978). In fact, these concentrations appear connected to similar high densities of metavolcanic fluted points reported for Mecklenburg, Union, Stanly, and Union Counties in North Carolina (Peck 1988:Map 2).

Metavolcanic points occur in the western Piedmont sporadically. It is our impression that rhyolite and other conchoidally fracturing lithic materials are available here naturally, but are not as siliceous and homogenous as similar materials to the east. Some of the black, gray, and green welded vitric tuff artifacts found in Lancaster and Chesterfield Counties almost appear to be chert they are so dense and siliceous. The differentially crystallized tuff is of the same quality as these. More work is needed to locate and describe these cryptocrystalline metavolcanic sources which are suggested based on Paleoindian and Archaic artifact distributions to be located in the northern area of South Carolina (Cable and Cantley 1979; Charles 1981:46,55).

The predominant siliceous material in the western Piedmont is quartz (Canouts and Goodyear 1985; Charles 1981:53). It is clear from both the work of Michie and Charles (Tables 1, 2) that quartz was utilized for the production of fluted and other basally thinned lanceolate points. This material no doubt posed certain technological problems in the production of long flutes. The recognition of Paleo-Indian lanceolates among quartz bifaces has caused us some consternation because recognition of fluting and other subtle flaking patterns are difficult. The possibility of not recognizing Paleoindian lanceolates made from quartz because they lack the diagnostic flute or deep basal thinning flake is probably real.

The last raw material distribution that merits discussion is the presence of dark colored, vitreous cherts which probably originated in the Ridge and Valley Province of eastern Tennessee. In Figure 5 it can be seen that the majority of these specimens occur in the northwest portion of the state, especially along the Savannah River. The origin of the dark cherts, usually black, gray, and blue in color, both translucent and opaque, may not be completely in the mountains, however. While many dark chert artifacts and debitage from the Archaic and Woodland periods are identical with Ridge and Valley cherts of eastern Tennessee, there may be a Piedmont source for some of this material based on the presence of a hard, pitted volcanic-like cortex (see Goodyear *et al.* 1979:184-187; Anderson and Schuldenrein 1983:181-183). Preliminary petrologic analysis (Anderson 1979:37; Sam Upchurch, personal communication) would indicate that some of it has an igneous-metamorphic origin rather than sedimentary suggesting a Piedmont source. In addition to the interesting geographic distribution indicated for the dark chert Paleoindian points, is their relatively small size compared to lanceolates made from Coastal Plain chert and metavolcanic materials. Lumps of chert and cortical flakes suggest that the original nodules were small (<10 cm diameter). Five of the 12 "Ridge and Valley" points recorded by Charles (Table 2) are classified here as "Clovis-variant" meaning they were small and triangular or pentagonal in blade outline. Two black chert fluted points were excavated in the Richard B. Russell Reservoir data recovery program. One waterworn specimen came from a Mississippian midden at the Clyde Gully site probably collected and reused late in prehistory (Tippitt and Marquardt 1984: Figure 8-3, j). The second one was excavated from the lower levels of Rucker's Bottom (Figure 1) among several Early Archaic artifacts (Anderson and Schuldenrein 1983:Figure 2, j-k).

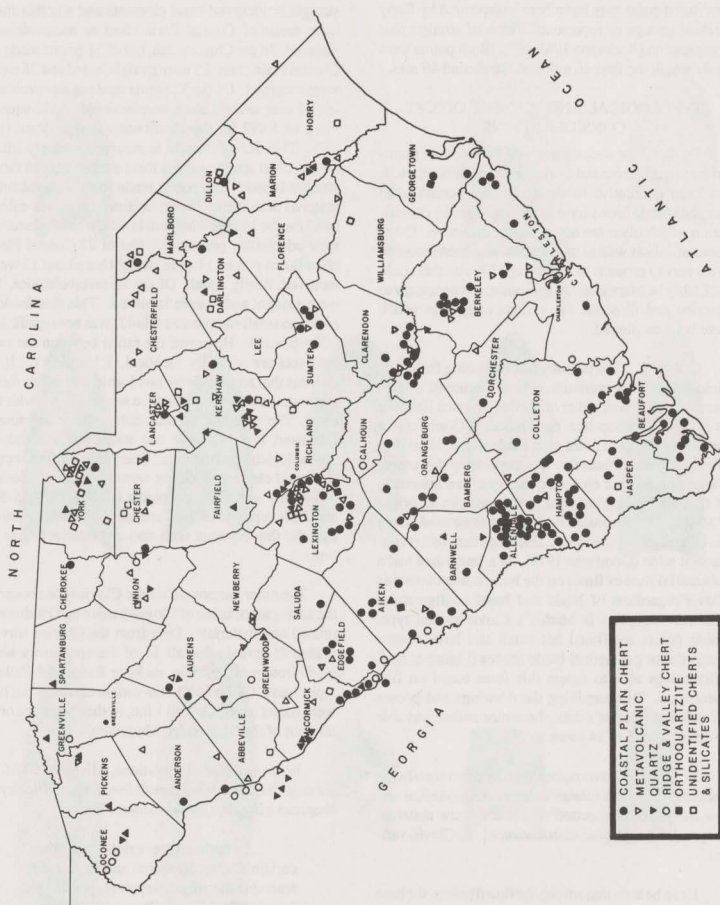


Figure 5: Distribution by raw material of points from the Palcoindian period in South Carolina (from Charles 1986:Figure 2).

Anderson and Schuldenrein (1983:183) suggest that this fluted point may have been redeposited by Early Archaic groups or represents a case of stratigraphic compression (Anderson 1988:107). Both points were fairly small, the first 46 mm and the second 49 mm.

TYPOLOGICAL AND TECHNOLOGICAL CONSIDERATIONS

To date, our classification of Paleoindian points has been qualitative and to a large degree subjective. It has been qualitative in the sense that certain ideal morphological forms have been employed in classification which often are not mutually exclusive. Other nominal data as well as metric data have been recorded in the survey projects of Michie and Charles that could profitably be examined. At this point, it is necessary to describe and illustrate the various categories which have been employed.

CLOVIS The primary distinguishing feature of these points is the pronounced flute (Figure 6). Flutes were detached as single or multiple elongated flakes or as a single scallop-like detachment. Considerable variability exists in point size, blade shape, basal outline, and basal concavity. As previously discussed, Clovis points occur on a wide variety of raw materials, of Coastal Plain, Piedmont, and mountain in origin (Table 2). They consistently appear to be made from the best quality cryptocrystallines, a pattern that is continental wide (Goodyear 1979). If a lanceolate had a substantial flute or flutes on the base, it was classed as Clovis regardless of blade and basal configuration. The one exception is Michie's Clovis-variant type. These points are fluted but small and have narrow triangular or pentagonal blade shapes (Figure 6: n,o). Michie was able to detect this form based on five specimens. By examining the drawings and photos recorded in Charles's data, the senior author was able to detect a total of 14 more.

Within the Clovis points, there are two significant patterns. The first relates to basal configuration and raw material. The second concerns the raw material, shape, and geographic distribution of the Clovis-variant.

It can be seen that among the fluted points, the base or haft area is either straight (Figure 6: a-g) or is slightly incurved toward the base yielding ears (Figure 6: h-m). This distinction is based on simply the haft area regardless of the blade shape. Variation in blade shape is probably related more to retipping and reworking. Using the drawings of Michie and Charles, Clovis

points were classified by the senior author as to either straight or incurved basal elements and whether they were made of Coastal Plain chert or metavolcanic material. In the Charles data, out of 51 points made of Coastal Plain chert, 25 were straight based and 26 were incurved. Of the 32 points made of metavolcanics, 24 were straight and 8 were incurved. A chi-square value of 5.492 for this distribution is significant ($p < .02$). The ratio of straight to incurved is nearly equal among chert specimens but there are three times more straight based fluted points made from metavolcanic material than chert. The same distribution was calculated for the Michie survey data where basal elements were adequately preserved. Out of 27 Coastal Plain chert fluted points, 14 were straight based and 13 were incurved, nearly equal. Of the 16 metavolcanics, 12 were straight and 4 were incurved. This distribution owing to small sample size ($N=43$) was not significant ($20 > p > .10$). However, the ratios between the two data sets are virtually identical, 1:1 and 3:1. It is obvious that among the metavolcanic specimens there is a strong tendency to produce straight bases with no ears. The meaning of this difference is unknown. However, it very likely has some cultural and or chronological significance. The production of incurved basal elements yielding ears is typical of Florida Suwannee and Simpson points (Bullen 1975:55-56) and Dalton points in the Carolinas, which may imply that the fluted points with ears are relatively late in time.

The other pattern within the Clovis type concerns the strong association of Clovis-variant and Piedmont-related raw materials. Data from the Charles survey (Table 2) reveals that all 14 of the specimens were made from metavolcanic rocks or Ridge and Valley-type cherts. Of the 14 Clovis-variant cases, all but two were found along the Fall Line, in the Piedmont or at the foot of the Blue Ridge Mountains.

In his original observations, Michie (1977:62), although his sample was small ($n=5$), had difficulty in characterizing the Clovis-variant. To wit:

... another type exists that shares certain Clovis attributes and it seems to resemble the projectile point types that are found at Bull Brook (Byers 1954), Shoop (Witthoft 1952), and the Williamson site (McCary 1975). The attributes of these points suggest a relationship to many types, but as a representative type they are difficult to define. These points are either par-



Figure 6: Varieties of fluted points from South Carolina. a-Berkeley Co., b-Darlington Co., c-Clarendon Co., d-Aiken Co., e-Marion Co., f-York Co., g-Berkeley Co., h-Berkeley Co., i-Beaufort Co., j-Berkeley Co., k-Kershaw Co., l-Allendale Co., m-38GR8, n-Berkeley Co., o-York Co.

allel, triangular, or pentagonal in outline, and for the most part they are poorly made. Many irregularities are seen along the edges, and apparently no attempt was made to correct them, and the removal of the channel flakes for fluting appears to be random and without design. Frequently a multiple removal of channel flakes is seen on both surfaces, and these flakes failed to extend up the point's surface before terminating (Michie 1977:62).

The "Clovis-variant" category, because of its difficulty in definition, appears to be functioning as a residual type in classification. Any fluted or basally thinned lanceolate point that cannot comfortably be classed as Clovis, especially if it is not made of Coastal Plain chert, is categorized as a Clovis-variant. The high degree of irregularity in blade shape, fluting, and the comparatively small size (<50 mm) all suggest that this category may represent fluted points that have been intensively reworked from larger and probably more consistent designs. The pentagonal shape of the blades is evidence of an extreme form of re-tipping where there is little blade length left to work. Variability in fluting and basal thinning could be related to improvising in the field where a point is made from a damaged basal or blade portion or from a curated flake which do not allow the normal fluting preparations to be made. The strong association of the Clovis-variant and the Piedmont parallels the situation in Georgia where it has also been reported that Piedmont fluted points there tend to be small and heavily reworked (O'Steen *et al.* 1986; Anderson *et al.* 1987:48). Given the apparently poor cryptocrystalline lithic resources of the South Carolina Piedmont, one cannot help but wonder if the Clovis-variant represents attempts to conserve high-quality and usually imported curated projectile points. It is probable that some of the Clovis-variants represent these situations and not a culture-historical type. Given the technological dependence of fluted point groups on cryptocrystalline raw materials and the strong geographic association of these points with raw material sources (Gardner 1974), regions such as the western Piedmont of South Carolina which seem to be cryptocrystalline poor become interesting areas to study Paleoindian technological adaptations because tool replacement may have been difficult by local procurement. One prediction of the cryptocrystalline hypothesis (Goodyear 1979) is that greater efforts will be made to extend the lifespan of tools as groups become more spatially and temporally removed from cryptocrystalline quarries. Culture-historically, some of these

may also represent what are thought to be later smaller Paleoindian fluted points hypothesized to exist temporally between Clovis and Dalton in the Southeast (Gardner 1974:18; Anderson *et al.* 1986).

Although the fluted points recorded in the Michie and Charles surveys were not classed except as "Clovis" or a variant of Clovis, a casual inspection of that data reveals interesting differences and similarities between South Carolina fluted points and fluted points from the rest of the Southeast and Midwest. Based on over 20 years of recording and a sample of over 300 lanceolate specimens, no certain examples of the Cumberland fluted point have been found. The single Cumberland point recorded and illustrated by Charles (1981:77) is not thought to have been found in South Carolina. It was made of a gray exotic chert, and the owner was known to collect and trade heavily in Tennessee and Kentucky.

Fluted points described as Ross County in the mid-continent area (Prufert and Baby 1963:15-16) can be detected in the South Carolina specimens. Pronounced flutes not extending more than one third of the point length and slight basal constrictions are evident on some points (Figure 6: h,i,l), as well as the characteristic flat, expanding, lateral thinning flakes on the blade (Figure 6: l), all of which characterize the Ross County type. Elongated triangular or convergent-sided points with nearly full facial fluting (Figure 6: d,f,j,k) can also be noted which are similar to fluted points which have been called Redstone elsewhere in the Southeast (cf. Mason 1962: Figure 4).

SUWANNEE Lanceolate points with excurvate blade edges and a flaring base which did not possess a flute or a clear basal thinning flake were called Suwannee in both the Michie (1977:56-57) and Charles surveys (Figure 7: a-d). As Michie (1977:56) notes, "In the majority of the examples the bases of the points are thinned rather than fluted, and this trait usually reflects the removal of many small flakes that extend, occasionally, across the width of the base." The Suwannee point as found and defined in Florida (Bullen 1975:55) normally is not fluted or strongly basally thinned by flakes removed from the basal concavity. In fact, a strong trait that characterizes the Florida Suwannee is what has been called lateral thinning where flakes are removed from the sides of the haft area almost in the manner of parallel flaking (Goodyear *et al.* 1983:46). The lateral thinning method typical of the Florida Suwannees is rare in South Carolina. Examples of lateral basal thinning can be seen on a Simpson point



Figure 7: Suwannee, Simpson, and Dalton points and fluted preforms from South Carolina. Figure 7: n is a so-called eggstone. a-Aiken Co., b-38HA104, c-38LX50, d-McCormick Co., e-38HA72, f-Aiken Co., g-Orangeburg Co., h-38AL135, i-Orangeburg Co., j-Chester Co., k-38AL23, l-Lexington Co., m-38AL135, n-Hampton Co.

(Figure 7: e) and a Hardaway-Dalton (Figure 7: g).

A factor complicating a clear-cut recognition of Suwannee points is the existence of the early stage, unresharpened Dalton point. Dalton points, as discussed below, definitely occur in the state and in their earliest stages of use might be difficult to distinguish from Suwannee points. This situation has been discussed by Brooks and Brooks (n.d.) with regards to the culture-historical and technological position of the Dalton point on the Coastal Plain *vis a vis* Suwannee and Simpson points. A detailed technological attribute study of Dalton bases is needed to isolate other technological characteristics of Dalton points besides blade resharpening in order to allow better typological definition.

Based on both the Michie and Charles surveys, it is clear that Suwannee points as well as Simpson points occur primarily in the southern half of the state. The majority of them are made from Coastal Plain chert (Tables 1 and 2) and in that respect seem to share cultural and technological affinities with the Suwannee-Simpson concentrations known from the Coastal Plain of Georgia and Florida. Charles (Table 2) recorded some unfluted lanceolates as Suwannee and Simpson that were made of quartz and other Piedmont raw materials. Whether these are truly technologically equivalent to Suwannee-Simpson points as created on Coastal Plain chert or "Clovis" points that were not fluted is not known. More detailed work needs to be done to define what are called "Suwannee" points in South Carolina.

SIMPSON The last type used in both surveys is that of the Simpson. Simpson points were defined by Bullen (1975:56) for the state of Florida. They are similar to Suwannee points but have more excurvate blade margins and a drastically constricted or "waisted" haft area (Figure 7: e,f,i). Like Suwannee points, they are not fluted but basally thinned occasionally by lateral flaking (Figure 7: e). In the Michie and Charles surveys, if a lanceolate had the exaggerated waistedness of a Simpson point but had a pronounced flute, it was called a Clovis. Judging from both the Michie (Table 1) and the Charles (Table 2) survey data, Simpson points are relatively rare in South Carolina.

Distinguishing between a Suwannee and a Simpson point has been very subjective, complicated by the fact that the blades undergo considerable reworking causing the degree of constriction between the blade and haft areas to be more or less exaggerated. A

method of quantitatively differentiating Suwannee and Simpson points based on basal metrics has been offered by Goodyear *et al.* (1983). By plotting the ratio of the minimum width of the stem or haft area against the maximum width across the ears, quantitative separation of the two types can be achieved (Goodyear *et al.* 1983: Figure 7). This method plots true basal constriction independent of blade condition.

DALTON The Dalton culture or horizon of the southeastern United States has been defined and discussed by numerous authors (DeJarnette *et al.* 1962; Coe 1964; Morse 1971, Morse and Morse 1983; Goodyear 1974, 1982; Smith 1986). Although variations within the lithic tool kits can be noted from region to region, the characteristic serrated and resharpened Dalton lanceolate is the hallmark of the horizon (Goodyear 1982). While C¹⁴ dates securely associated with Dalton assemblages are rare at this stage of archaeological research in the Southeast, C¹⁴ dates from later Early Archaic notched point assemblages and circumstantial evidence would indicate that the Dalton horizon should date from about 9,900 to 10,500 B.P. at the latest and earliest respectively (Goodyear 1982). As discussed above, subsistence data gathered thus far would indicate that Dalton people were oriented toward the modern flora and fauna of the Holocene.

The Dalton point has been recognized and described in South Carolina by Michie (1973a, 1973b). An excavation specifically designed to recover buried Dalton remains was conducted by Michie at the Taylor site (1971; 1977) (Figure 1) with moderate success. Dalton points were found *in situ*, with horizontal distributions relatively segregated from later Early Archaic notched points, but not well separated vertically from the notched points (Michie n.d.). Apart from that work, Dalton assemblages in the sense of the Brand site (Goodyear 1974) or the Rodgers Shelter (McMillan 1971) have not been encountered in South Carolina excavations, although Dalton points have infrequently been found in the lower levels of stratified sites such as G.S. Lewis and Pen Point (Figure 1) (Hanson and Sassaman 1984; Hanson 1985; Sassaman 1985), Nipper Creek (Figure 1) (Wetmore and Goodyear 1986), the Theriault site (Brockington 1971), Taylor Hill (Elliott and Doyon 1981), and at Haw River (Cable 1982). Dalton points, though not specifically recorded in the Michie and Charles surveys of Paleoindian lanceolates, are relatively common compared to fluted points. Roughly speaking, Dalton points are from five to ten times more common than fluted points in large private

collections.

Technologically, the Dalton points of the Carolinas are resharpened in a manner similar to those classic forms of the Midwest (e.g., Goodyear 1974; Morse and Morse 1983), but are rarely beveled in the process and only infrequently have the drill-like advanced form of resharpening. Daltons in the Carolinas are bifacially resharpened which also yields a shoulder effect (Figure 7: h). The Hardaway-Dalton (Coe 1964; Figure 57; Cable 1982: Plate 3), frequently possessing the exaggerated out-flaring ears (Figure 7: g), is rare throughout most of South Carolina but is more common in the north-central part of the state. Dalton points in South Carolina also show evidence of recycling such as end scrapers formed on the distal portion and possibly burins (Michie 1973a).

The cultural and adaptive significance of the Dalton culture or horizon has captured the attention of archaeologists for the past three decades (e.g., DeJarnette *et al.* 1962; Morse 1973; Morse 1977; Schiffer 1975; Smith 1986). The technological similarity of the Dalton point and associated lithic tools with previous fluted point technologies is obvious. Conversely, the addition of pronounced serrations applied to the blade margin through repeated resharpenings and the addition of woodworking implements such as the Dalton adze, indicate that Archaic adaptations were underway. This coupled with the modern flora and fauna associated with Dalton assemblages all argue for an Early Archaic classification of Dalton (Goodyear 1982). In South Carolina, the dramatic increase in Dalton points compared to fluted points and their nearly uniform dispersal throughout the uplands or interfluvial zones, both indicate demographic-settlement changes had taken place over former Paleoindian systems.

In South Carolina there is also a raw material change present in Dalton points that complements these changes. On many points there is a noticeable decline in the selection of hard siliceous lithic materials. This can be seen on Daltons made of less chemically stable rhyolites and tuffs such that they appear very weathered giving almost a dissolved appearance (e.g., Michie 1973b: Figure 1: b,d,h). While the interior material of these weathered points is usually dark colored and siliceous indicating a reasonably good raw material at the time of manufacture, nevertheless, these metavolcanics are not as physically resistant to weathering as earlier fluted point materials. Dalton people were also the first to intensively exploit the orthoquartzites of the Coastal Plain. Only one point of this material,

a Suwannee, was recorded in the lanceolate surveys (Table 2). Orthoquartzites are cemented or silicified sandstones (Novick 1978; Upchurch 1984), sources of which are known in the Santee (Anderson *et al.* 1982:120-122) and Savannah River valleys (Goodyear and Charles 1984). Like some of the metavolcanics, these sandstones tend to weather easily. Dalton points made from orthoquartzites are usually very grainy and friable whereas late prehistoric artifacts retain more silica and present a sharp conchoidal fracture. The use of orthoquartzites by Dalton people, a material almost completely ignored by earlier Paleoindian folk, initiated use of this material that continued throughout prehistory. Based on the use of softer, more easily weathered rhyolites and orthoquartzites, a relaxation of the former Paleoindian reliance on cryptocrystalline lithic raw material is present in Dalton points. This likely signals more local lithic raw material procurement, another prominent feature of the Archaic stage in eastern North America.

Another interesting feature of Dalton points in South Carolina is their decided decrease in manufacturing quality. Although many are well made, a fair number appear to be relatively crude. In this respect, they do not come up to the high technological standards of Dalton points made in the Midwest. This technological decline in manufacturing is all the more remarkable in that subsequent Early Archaic side and corner notched points are often better made and made from superior metavolcanic lithic raw materials. In particular, the side notched Taylor point (Michie 1966) is a finely crafted point and is resharpened on alternate margins yielding a pronounced left bevel. The care taken in manufacture and resharpening is highly reminiscent of the northeast Arkansas Dalton which has, however, a right bevel.

PREFORMS The foregoing discussion of lanceolate types has been hampered by a lack of excavated data from clear interpretable contexts. Further, criteria for classification have been relatively simple based on basal thinning treatment and to some extent the outline of the point. As discussed, there is a need to analyze the corpus of lanceolate points using several technofunctional attributes to search for variability which may have behavioral and temporal meaning not detectable with the previous typological categories.

One research strategy that could help differentiate hafted biface systems is that of technological or production analysis. Of course, the finished bifaces we call "Clovis", "Suwannee" etc., came into being through

a series of reduction stages or a technological trajectory. It is well known from flintknapping that the end points or final stages of reduction are conditioned by the parent blank or preform and the specific reduction techniques applied to achieve the final form. Because of extensive removal of lithic material, it is often difficult to discern the early stages by examining the final form. If a detailed understanding of the various production strategies of lanceolate points were developed, more information about Paleoindian technological adaptations would be available to relate to the broader cultural system. This is the case because past reduction strategies probably did not consist of one technique that took place at a single location. Rather, given the Paleoindian pattern of regional mobility, reliance on geographically limited lithic raw material sources, and a need to be anticipatory in terms of future technological needs (Goodyear 1979), biface, and other core reduction probably took place at a number of different locations. Thus, much of the reduction and core preparation done at the quarry should be in anticipation of future needs at locations substantially removed in time and space from the quarry source (Goodyear 1985).

To gather such technological data, fieldwork has been oriented toward quarries. Given the importance of Coastal Plain chert in South Carolina Paleoindian technologies, surveys and excavations have been conducted at quarries in Allendale County. Fieldwork has yielded definite Dalton and pre-Dalton components at three quarries, the Topper quarry (38AL23) and two quarries in Smiths Lake Creek (38AL135, 38AL143) (Goodyear and Charles 1984; Goodyear *et al.* 1985). These sites are located in the Savannah River floodplain (Figure 1) and are subject to alluvial burial. The quarries are also critical to the overall study of Paleoindian because of their relatively high density of artifacts which are a result of repeated visits by mobile groups to a spatially restricted resource, Allendale chert. It is well established in the East that Paleoindian points increase in geographic density according to their proximity to cryptocrystalline sources (Gardner 1974; Dunbar and Waller 1983; Futato 1982). The pattern exists in South Carolina as can be seen in the high density of points in Allendale and Hampton Counties (Figure 5). Apart from chert quarries, the probabilities are low that dense, lithic remains amenable to excavation will be found on the typical South Carolina Paleoindian site. In most cases, a "site" consists of a single lanceolate point from a plowed field. The finding of more than a single point in one field is rare (cf. Michie 1977:99; Charles 1983:5). This lack of dense, spatially

discrete concentrations of Paleoindian artifacts which lend themselves to excavation parallels the situation over much of the Southeast confounding the study of Paleoindian remains (cf. Meltzer 1988:11-14).

The analysis of lanceolate preforms has an indispensable place in Paleoindian studies as a means of reconstructing production strategies (Crabtree 1966; Callahan 1979). Preforms, whether found in an excavated context at a quarry or as isolated finds, retain critical information about manufacturing that can be extrapolated to the overall trajectory. It has been established through modern flintknapping experiments that the cross sectional morphology of the preform and surface flaking patterns are critical to the removal of the flute (Crabtree 1966). Particularly of interest is the stage in the reduction sequence at which the flute or flutes are removed (Flenniken 1978).

Figure 7 illustrates some Paleoindian biface preforms from South Carolina. One specimen (Figure 7: j) appears to have been strongly fluted unifacially and subsequently used as a tool without completing the point. This piece may have been further flaked after fluting. This preform was found in Chester County, made from Allendale chert, and was transported probably over 100 miles from its source. The piece is 8 mm in thickness and could have been made into a projectile point without further thinning. If so, fluting would not have been the final treatment as is usually thought to be the case.

The specimen illustrated as Figure 7: k is bifacially fluted and was found at the Topper quarry in Allendale County. The flute depicted is 45 mm in length. The reverse side flute is 52.6 mm. Both flutes were detached from a scraper-like bevel. This biface is 12 mm in thickness and exhibits no secondary flaking. The remarkable thing about it is how carefully and completely fluted it is in the early stage of manufacture. Painter (1974) has argued that fluting in the Cattail Creek Fluting Tradition, as defined from the Williamson site in Virginia, was done in the early stages of manufacture and was done more than once to achieve the final fluted form. Callahan (1979:15) has debated this at length and believes that what Painter has identified as "fluting" in the early stage of a preform is in fact "end-thinning", a flute-like flake detached from the base in order to remove thick places which could not be removed by flakes struck from the lateral margins. The fluted preform illustrated in Figure 7: k is fluted with excellent skill and preparation, giving the impression that it was purposefully done rather than to

eliminate a thickness problem. End-thinning, as termed by Callahan (1979), has been observed on thick, aborted bifaces from 38AL135, a quarry on Smiths Lake Creek (Goodyear *et al.* 1985: Figure 1:g).

The preform depicted in Figure 7: m is from 38AL135. It is weakly fluted or strongly basally thinned and only on one face. It is 10 mm in thickness and somewhat crudely flaked indicating that it was not in its final stage of manufacture. This piece, like the examples of Figure 7: j and k, suggests that basal fluting was not necessarily the last point of manufacture.

The last example is a remarkably large and well made preform of Allendale chert (Figure 7: l). Although it cannot be ascertained without a doubt that it is a Clovis preform, the large size (over 117 mm), outline, weathering, and bifacially produced flute-like flakes (29 mm and 23.5 mm) all imply something on the order of Clovis. The piece was made by carefully executed bifacial percussion, yielding a uniformly flat biface which is less than 10 mm in thickness in most places. This preform could have been secondarily flaked and fluted for a final time if desired. It has also been finely retouched on the left lateral margin creating a sharp unifacial working edge. There is no other pressure retouch on the biface nor is there any grinding. This piece was found in West Columbia near the Saluda River by a family planting shrubbery. Like the preform found in Chester County (Figure 7: j), it has been transported several miles from its original source, probably in Allendale County. It is objects like this, full of utility and several miles from their original quarry source, that hold promise for understanding how groups organized and employed their chipped stone technologies over the South Carolina landscape.

OTHER TOOLS Beyond the problem of not having excavated Paleoindian sites with assemblage clarity, is the oft-noted fact that many of the chipped stone tools of fluted point groups continued to be made by subsequent Early Archaic peoples. Tools such as unifacial end and side scrapers, gravers, true blades, and bipolar cores were made over about a three thousand year period. It is likely that some differences occurred in the tool kits of the various phases (Coe 1964), and certainly new tools were added during Early Archaic times such as the Dalton adze (Morse and Goodyear 1973), the Edgefield scraper (Michie 1972), and even a ground stone adze (Anderson and Hanson 1988: Figure 6).

True blades, associated with Clovis assemblages in the West and Dalton sites in northeast Arkansas (Goodyear 1974: Figure 19), occur infrequently in South Carolina surface collections but probably are not exclusively associated with Paleoindian. One retouched blade, likely referable to the Paleoindian or Early Archaic periods, merits mentioning. This piece (Figure 8) was found by a diver in the Combahee River in Colleton County at the site of Bluff Plantation (38CN7). The dorsal surface of the blade was carefully retouched with the scars terminating on the blade arris. The ventral face of the blade was only marginally retouched except for the distal end which is covered with fine flaking. Because the blade was struck from the notched or strangulated end, the retouched, slightly swollen area of the ventral face probably represents a thickened area from the blade plunging back through the core. The piece is water stained but appears to be made of Coastal Plain chert. True blades, especially modified hafted blades, are not known for later cultural periods in South Carolina. The bilaterally notched proximal end is reminiscent of notched or tanged flakes called Waller knives in Florida (Waller 1971; Purdy 1981: Figure 14), tools that are also found infrequently in South Carolina (Charles 1981: 78; Anderson and Schuldenrein 1983: Figure 6:g). In Florida, there is a strong association of Waller knives with Suwannee and Bolen points and Edgefield scrapers in the early Holocene river sites (Purdy 1981).

Another possible early lithic tool either Paleoindian or associated with Early Archaic notched points, is the so-called eggstone (Figure 7: n). These are smoothed stones about the shape of a hen's egg which have a small indentation on the pointed end. The indentation is pecked and ground smooth. These implements, also called clubheads, bolas, and pitted stones, are found throughout the South Atlantic region including North Carolina (Peck 1983), Georgia (Snow 1976; Whatley 1986), and Florida (Neill 1971). No excavations have yet produced them in interpretable context, but in Florida they are found in the early river sites which produce Suwannee and Bolen points (Purdy 1981: 30). In his examination of private collections throughout South Carolina, Charles has observed them frequently in the Piedmont and Coastal Plain. The eggstone depicted in Figure 7: n is from Hampton County.

It is likely that bone and ivory artifacts are present in the Coastal Plain rivers of the state. Unlike Florida with its clear water and rich Paleoindian finds in the rivers, sport divers in South Carolina have concen-

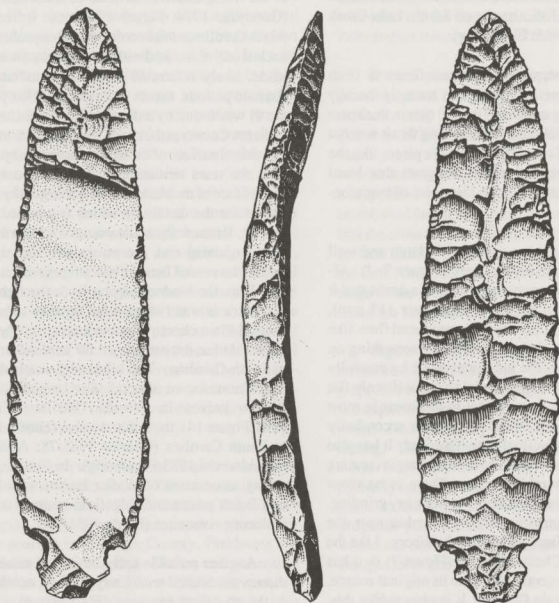


Figure 8: Bifacially retouched tanged blade found off Bluff Plantation in the Combahee River, 38CN-7-8-33, Colleton County, South Carolina. Drawing by Darby Erd. Actual size.

trated more on historic artifacts, probably because of their abundance and monetary value. Prehistoric artifacts have been found, including a few fluted points from the Cooper River. The dark, heavily stained waters of the low country may inhibit prehistoric artifact collecting compared to the high visibility of the Florida rivers and springs. In Florida, because of drastically reduced surface water from depressed sea levels, Paleoindian sites appear to have been originally located in the river beds and springs. It is unlikely that South Carolina rivers were as strongly affected by lowered sea levels as Florida. Judging from the widespread distribution of lanceolate points including inter-

fluvial zones (Figure 5), there was no shortage of surface water for these early populations.

SUMMARY AND CONCLUSIONS

During the period of the earliest known human occupation of what is now South Carolina, from about 11,500 to 10,000 B.P., the climate and biota were considerably different from that of today. Clovis-related populations entered a landscape covered by a now-extinct mesic, broad-leaved, temperate forest. The climate was strongly seasonal with winter temperatures harsher than today. This environment character-

ized most of the state. In the southern third of South Carolina, below the 33rd latitude, the vegetation was more like that of today with a mixture of oak, hickory, sweetgum, and pine. Weather was warm-temperate and droughty in the summers. These strong environmental differences existed above and below the 33rd latitude due to the positions of two different weather systems, the Pacific Airmass dominating to the north and the Maritime Tropical Airmass to the south.

The rate and manner in which the cool mesic forest of the mid-latitudes broke up and was replaced by modern communities is not known in spatio-temporal detail. The one palynological index to the origin and decline of this forest for South Carolina, that of White Pond, suggests that its demise was rather abrupt, beginning around 10,000 B.P., as indicated by the increase of modern pine (Watts 1980:190). Except for the southern end of the state, it is significant that there was basically one forest and climatic regime implied by the mesic forest, spanning a length of time that contains several early phases of cultural life. These include Clovis, post-Clovis (Suwannee, Simpson), Dalton, Taylor side-notched, and Kirk corner-notched cluster (11,500-9,500 B.P.).

Within the span of the cool mesic forest's existence, about 13,000 to 9,550 B.P. (Watts 1980:190), substantial changes took place in animal populations. This period witnessed major extinctions of herbivores and grazers of known economic importance in the western United States during the time of the Clovis culture. Based on the terminal radiocarbon dates (Meltzer and Mead 1985) for these species, as well as geological and archaeological stratigraphy throughout North America (Haynes 1984), there is strong evidence that their extinctions were complete by 10,500 and perhaps even earlier. The Clovis culture of the western United States, radiocarbon dated from 11,200 to 10,900 B.P., was the last Paleoindian group known to exploit the now-extinct megafauna (Haynes *et al.* 1984). Accordingly, archaeologists may have to develop settlement-subsistence models which seek to explain fluted point and other basally thinned lanceolate lithic technologies and related strategies without the economic presence of Pleistocene megafauna.

The floristic zonation expressed in the reconstructions of forest types by Delcourt and Delcourt (1985) was also represented in the geographic distribution of animal populations. Webb's (1981) reconstruction of three fauna regions co-existing in what is now South Carolina would also indicate that significant environ-

mental variability existed north to south, with the middle Temperate zone functioning as a prominent ecotone. The area now called South Carolina would have contained extraordinary biotic variation by latitude within a relatively short space, as all three faunal regions would be encountered within a span of 100 miles. It is clear that the Savannah River valley as it runs northwest to southeast, would have contained the maximal environmental and biotic variation as it traversed significant portions of all three zones. Difficulties exist in dating the duration and demise of these Pleistocene faunal populations and correlating them in time with human groups who may have exploited them. Strong evidence from the rivers and springs of Florida in the form of mammoth, horse, and bison bones with butchering marks would suggest that Paleoindians in the South Carolina area were also likely exploiting now-extinct Pleistocene animals. The elephant rib with apparent cut marks from Edisto Island would lend empirical evidence to this proposition.

Archaeological fieldwork over the past 25 years has not produced a Paleoindian site with stratigraphic or contextual integrity of such quality to permit isolation of a lithic assemblage or dating by absolute or relative means. Individual fluted points have been excavated in the lower levels of sites but with later Early Archaic notched points always present. In South Carolina, vertical accretion on interfluvial and even fluvial landforms was not of a magnitude sufficient to bury and vertically separate succeeding cultural phases, except perhaps in the Piedmont floodplains. The Piedmont and Fall Line regions have produced Holocene fluvial sediment accumulations in excess of 3 m. Early Archaic artifacts, however, are the earliest occupations documented thus far (Tippitt and Marquardt 1984). In the major river valleys of the Coastal Plain, floods have deposited alluvium over Early Archaic and probable Paleoindian (Goodyear and Charles 1984) occupational surfaces, the maximum thickness of which is less than 1.3 m. Given the lack of high vertical development of Coastal Plain floodplain features, it might be more productive to search for a spatially isolated Paleoindian site, one that was cut off from the river and subsequent reoccupation by Early Archaic groups due to channel migration. Such a site may be represented by 38AL135 along Smiths Lake Creek (Figure 1), located in the floodplain of the Savannah River (see Goodyear *et al.* 1985; cf. Brooks and Sassa-man 1988).

The most successful research strategy for the study of Paleoindian archaeology in South Carolina has been

the lanceolate point recording surveys. The Michie and Charles surveys together have produced over 300 points, including data on type, raw material, metric attributes, and location. This work has resulted in a large body of raw data suitable for attribute and typological analysis as well as distributional studies. It is clear that the classic western Clovis is present along with other varieties of fluted points. These include Redstone-like and Ross County fluted. The Cumberland fluted point has not been found. Small, pentagonal and triangular bladed fluted points have been noted, the Clovis-variant, which seem to have a strong Piedmont association. It was suggested that many of these may represent reworked fluted points of other designs. They may also represent a post-Clovis, pre-Dalton late Paleoindian point. Non-fluted, basally thinned lanceolates such as Suwannee and Simpson are present and usually made from the Allendale-type Coastal Plain chert. They occur more commonly in the southern and western portions of the state and express a geographic as well as raw material affinity with the Georgia-Florida area of the coastal plains in the use of Tertiary cherts.

The geographic distributions of the points by lithic raw material suggest the influence of high-quality cryptocrystalline sources, particularly the Coastal Plain chert known to have been quarried in Allendale County and in neighboring counties in Georgia. The highly dispersed distributions of metavolcanic points originating from the north in the Piedmont, and the Coastal Plain chert specimens known to have come from the Savannah River region to the south, all bespeak wide-ranging settlement systems. While many points have been found near major drainages, a surprising number have occurred away from streams in interfluvial zones. This suggests that there was no shortage of surface water, even on the Coastal Plain which was likely affected hydrologically by lowered sea levels during the late Pleistocene. The dense concentration of points along the Fall Line environs may have settlement-subsistence implications in two ways. First, the Fall Line represents a major physiographic ecotone between the Piedmont and Coastal Plain, making it strategic from a locational standpoint. Higher densities in this situation may reflect special base camps occupied for prolonged periods for exploiting the adjoining provinces, a strategy suggested for the Early Archaic period (Goodyear 1983). Second, the Fall Line locations may simply have been revisited more often, rather than longer or more intensively, due to the movement of groups back and forth from the Coastal Plain and the Piedmont. Only extensive excavations which can reveal the intrasite patterning, if any, of these Fall Line

sites will resolve this question.

It is important that greater typological and chronological resolution be obtained for the various fluted and basally thinned lanceolate points. Without such controls, it will be impossible to identify changes in settlement and technological strategies no doubt present during the first 1,000 years of human life in this region of the Southeast. The period from 11,500 to 10,500 B.P. witnessed the changes related to the initial founding of Clovis-related populations, the demise of the Pleistocene megafauna, and the transition of lifeways and technologies from a formerly Paleoindian to an increasingly Archaic way of life. This same scenario occurred throughout North America during this time, and the area now called South Carolina has its story to tell too.

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